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March 26, 1991

91-RF-1658

Robert M. Nelson, Jr.
Manager
DOE, RFO

IAG DELIVERABLE FOR EPA AND CDH: SUBMITTAL OF FINAL PAST REMEDY REPORT
OPERABLE UNIT NO. 3, IHSS 199

As required by the Interagency Agreement, we are transmitting the Final Past Remedy Report Operable Unit No. 3 IHSS 199 to EPA/CDH to meet the milestone delivery date of April 2, 1991. Comments received from EPA/ CDH on the draft of this report have been incorporated into the final report.

A draft letter of transmittal to EPA/CDH has been provided to Robert H. Birk along with the response to EPA/CDH comments. We are prepared to deliver the required number of documents to the agencies as soon as we receive your official transmittal letter. The Final Past Remedy Report is scheduled for a final review by EPA/CDH for 21 days.

If you have any questions or concerns regarding this document, please contact Michael Guillaume of the Remediation Programs Division at extension 4291.

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J. M. Kersh, Associate General Manager
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Orig. and 1 cc - R. M. Nelson, Jr.

Attachments:
As Stated

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REVIEW WAIVER PER
CLASSIFICATION OFFICE

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Attn: Rocky Flats Project Manager, 8HWM-RI
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Gentleman:

Enclosed are two copies each of the following document: "Final Past Remedy Report Operable Unit No. 3 -IHSS 199". The submission of this document by April 2, 1991 meets the regulatory requirements for Interagency Agreement (IAG) schedules.

Pursuant to the IAG schedule, the Environmental Protection Agency/Colorado Department of Health will review this document for 21 days.

Please contact me or Robert H. Birk of my staff at 966-5921, if you should have further questions.

EXECUTIVE SUMMARY

*John
3/26/99*

This Past Remedy Report for Individual Hazardous Substance Site (IHSS) 199 was prepared in response to requirements in the Interagency Agreement (IAG). The IAG identifies the following primary objectives for the Past Remedy Report:

1. Detail the history of the IHSS 199 remedy ordered by the U.S. District Court;
2. Detail the activities conducted to date to implement the remedy;
3. Detail the effectiveness of the remedy; and
4. Provide a health assessment which identifies the public health risk associated with potential exposure of the public prior to completing any site remediation, during implementation of the remedy, and after completion of the remedy.

The existing data for IHSS 199 were collected for the purpose of site characterization rather than to support a rigorous quantitative health risk assessment. After evaluating the existing data against U.S. Environmental Protection Agency (EPA) guidance for data useability in risk assessments, it became apparent that the data do not meet current quality control standards necessary to support a quantitative risk assessment. As a result, this Past Remedy Report includes a qualitative human health risk assessment which evaluates release mechanisms, transport mechanisms, and exposure routes associated with IHSS 199. In addition, a "generic" risk assessment calculation is included which shows the steps and the many assumptions underlying a quantitative risk assessment, and which generates risk values based upon hypothetical plutonium concentrations in soil under various exposure scenarios. This calculation is useful in helping to determine whether known contamination at IHSS 199 poses an imminent health risk to the public. The generic recreational lifetime excess cancer calculations of 7×10^{-7} to 7×10^{-8} is below the EPA target range of 10^{-4} to 10^{-6} . The following discussions provide a brief summary of the information provided in this report in support of the objectives listed above.

IHSS 199 is one of four IHSSs in Rocky Flats Plant (RFP) Operable Unit No. 3 (OU 3). OU 3 differs from other RFP OUs in that it targets possible contamination outside the RFP boundary. IHSS 199, Contamination of the Land's Surface, specifically targets off-site soil contamination as a result of RFP releases. Numerous studies have attempted to define the presence and extent

of such contamination, and to identify prospective on-site source(s) of contaminants. These studies have focused almost exclusively on airborne emissions of plutonium from the RFP, and particularly upon three possible RFP sources: 1) a September, 1957 fire in Building 771; 2) a May, 1969 fire in Building 776; and, 3) plutonium-contaminated soils at and around the 903 Pad, a former drum storage area east of the RFP main production area. These studies have concluded that the great majority of off-site soil plutonium contamination originated as windborne particulates from the 903 Pad. The 903 Pad was capped with asphalt in November 1969, effectively eliminating it as a direct source of contamination to IHSS 199. It is possible that on-site soils contaminated by the 903 Pad could in turn generate windborne particulates which might affect IHSS 199, as could any future non-routine emission from the RFP, including those generated by soil remediation and similar activities at on-site RFP OUs. Available data from off-site air monitoring stations suggest that IHSS 199 has not been measurably impacted by plutonium emissions from the RFP since the off-site air monitoring system was established in 1975. The air monitoring data are corroborated by on-site and off-site soil monitoring data.

Included within IHSS 199 are approximately 350 acres (142 hectares) of land which were the subject of a 1975 lawsuit filed by landowners against the United States and other defendants. A Settlement Agreement finalized in July, 1985 required the RFP to undertake remedial actions (remedy) on those portions of the land containing plutonium at concentrations exceeding a Colorado Department of Health (CDH) special construction requirements plutonium in soil standard (0.9 picocuries per gram [pCi/g]) adopted by the court. The remedy involves tilling the contaminated areas to reduce plutonium concentrations, and revegetating these areas to control wind and water erosion of the soil. To date, approximately 110 acres (45 hectares) have been tilled and partially revegetated. While plutonium concentrations in these areas have been reduced by tilling to below the CDH standard, the success of the revegetation to date has been limited by the following factors:

- insufficient amounts and poor seasonal distribution of precipitation
- extremely rocky surfaces or clayey soils
- intense competition from weeds, which provide insufficient soil stabilization
- an expanding prairie dog population
- the effects of slope and aspect on soil water.

Specific actions to increase revegetation success have been identified, and include actions to change the seed mixture and control prairie dog and weed populations.

Because past studies and data collection activities at IHSS 199 have focused almost exclusively on plutonium contamination, little is known about other possible contaminants there. As a result, the qualitative risk assessment focuses on plutonium as the contaminant of concern at IHSS 199. Air samples collected immediately downwind of the remedy acreage during remedy activities and at air monitoring stations in population centers downwind of the IHSS 199 remedy acreage have recorded no increases in airborne plutonium during or after the remedy actions taken to date, suggesting that there has been no measurable impact to human receptors downwind of the site as a result of the remedy. Without acceptable data, however, it is not possible to fully differentiate between the potential risk to human health prior to remedy implementation, during implementation, or after implementation. It is also uncertain without a quantitative assessment whether the remedy implementation activities will in fact reduce the potential risk.

The information presented in this report points to the following conclusions about IHSS 199:

- There does not appear to be any imminent human health hazard posed by IHSS 199. This conclusion is preliminary because of data quality limitations.
- Plutonium concentrations measured in some IHSS 199 soils during past studies and data collection activities exceed the CDH plutonium standard used by the U.S. District Court as the lawsuit acreage remedy action level. The data that support this conclusion, however, cannot be validated and may not be of comparable quality, and are therefore considered inconclusive.
- Multiple plutonium exposure pathways from IHSS 199 were analyzed. The pathway analysis suggests that the airborne dust inhalation pathway is the most significant in terms of human health risk under current site conditions. Under a future residential use scenario, the soil ingestion pathway may also be significant. Although other exposure pathways are not considered significant under this analysis, all pathways will be addressed under scheduled RCRA Facility Investigation/Remedial Investigation (RFI/RI) activities at IHSS 199.
- Although the actual receptor exposures could be expected to vary, the completed exposure pathways are the same for pre-remedy, remedy implementation, and post-remedy conditions at IHSS 199. If the remedy is successfully implemented, however, the concentration of plutonium available for transport as airborne dust will

be reduced through tilling, and the probability of occurrence for the airborne dust pathway will be reduced through revegetation.

- The control measures used to reduce off-site impacts during remedy implementation at IHSS 199 appear to have been effective. Available data from air samplers set up immediately downwind of the remedy acreage during remedy implementation and air monitoring stations in populated areas downwind of the acreage show no increases in airborne plutonium during or after remedial actions taken to date.

~~Additional data collection activities will be conducted during scheduled RFI/RI activities.~~ Risk assessment and site characterization needs will be integrated to ensure that all potential site contaminants and exposure pathways are identified and characterized to the extent necessary to perform a quantitative human health risk assessment.